Space Weather Forecast

Issued on Thursday, 05 January 2023 at 13:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate solar activity throughout. Chance of G1/Minor Geomagnetic Storm intervals on 5 and 6 January.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, with occasional C-class flares. The largest of these was from a sunspot region in the southwestern quadrant of the Sun. The remaining four regions are all either stable or fading. On the far southeast of the Sun a new region is slowly rotating into view. A CME from the southern hemisphere that left the sun on 2 January may impact Earth during the next 24 hours, but confidence is low.

Solar Wind / Geomagnetic Activity: Solar winds (post CME passage) declined from slightly elevated to Low levels. Magnetic field strength has been at mostly strong levels due to the influence of the CME. The important north-south component was at Weak to Moderate levels. Geomagnetic activity has been Quiet to Unsettled throughout.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be mainly Low, with a continuing chance for Moderate-class flares through the forecast period.

Solar Wind / Geomagnetic Activity: The effects of a CME which arrived at Earth on 04 January are expected to subside over the next 24 hours. A CME may then glance the Earth on 5 or 6 January, but with low confidence. Fast solar winds are also anticipated to affect the Earth at the same time, possibly giving slightly elevated or elevated solar winds. Solar winds then likely to decline again through 7 and 8 January. There is a chance of G1/Minor Storms for the next 24 hours. A return to Quiet to Unsettled conditions are then probable through 7 and 8 January.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms occurring. However, there is a slight chance of these rising in response to any larger flares that may occur, and perhaps exceeding the S1/Minor Radiation storm level.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	20	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	50	50	50
Very Active	R3 to R5 X	No	5	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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